

World Energy Outlook 2017

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Green Finance Research Advances

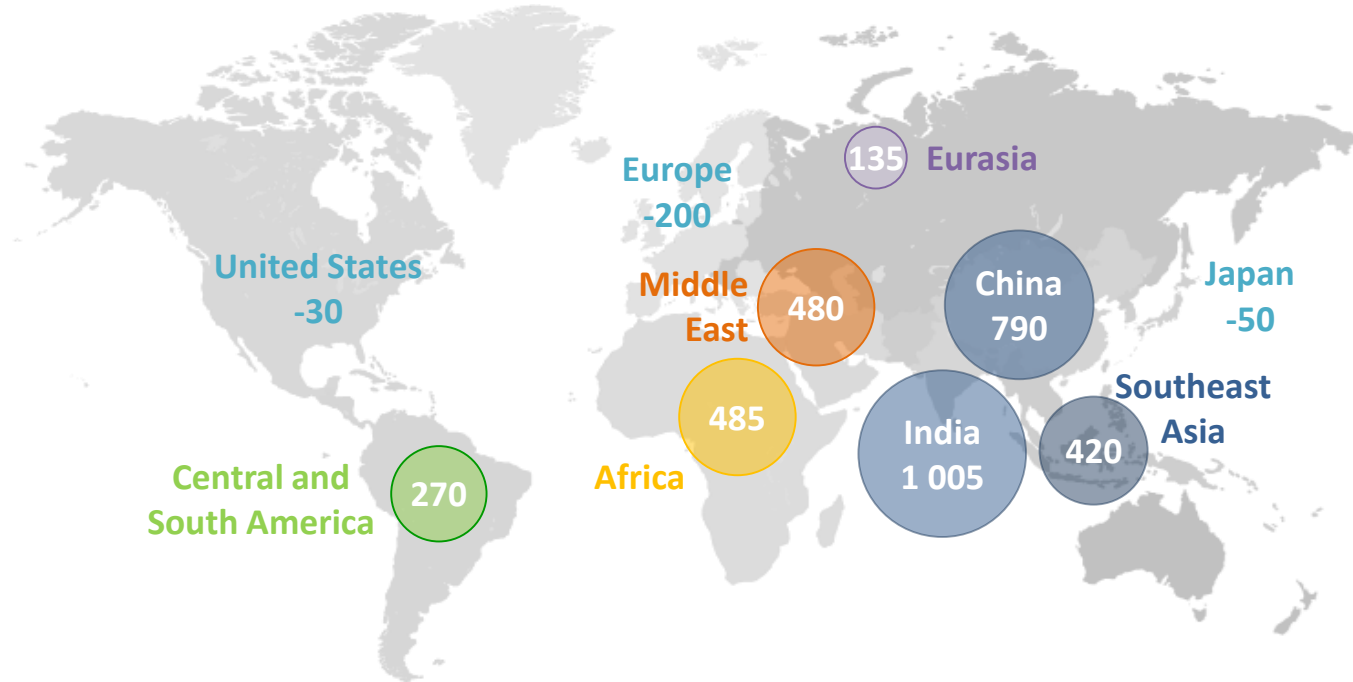
14 December 2017, Paris

Tipping the energy world off its axis

- Four large-scale upheavals in global energy set the scene for the new *Outlook*:
 - The **United States** is turning into the undisputed global leader for oil & gas
 - **Solar PV** is on track to be the cheapest source of new electricity in many countries
 - **China's** new drive to “make the skies blue again” is recasting its role in energy
 - The future is **electrifying**, spurred by cooling, electric vehicles & digitalisation
- These changes brighten the prospects for affordable, sustainable energy & require a reappraisal of approaches to energy security
- There are many possible pathways ahead & many potential pitfalls if governments or industry misread the signs of change

India takes the lead, as China energy growth slows

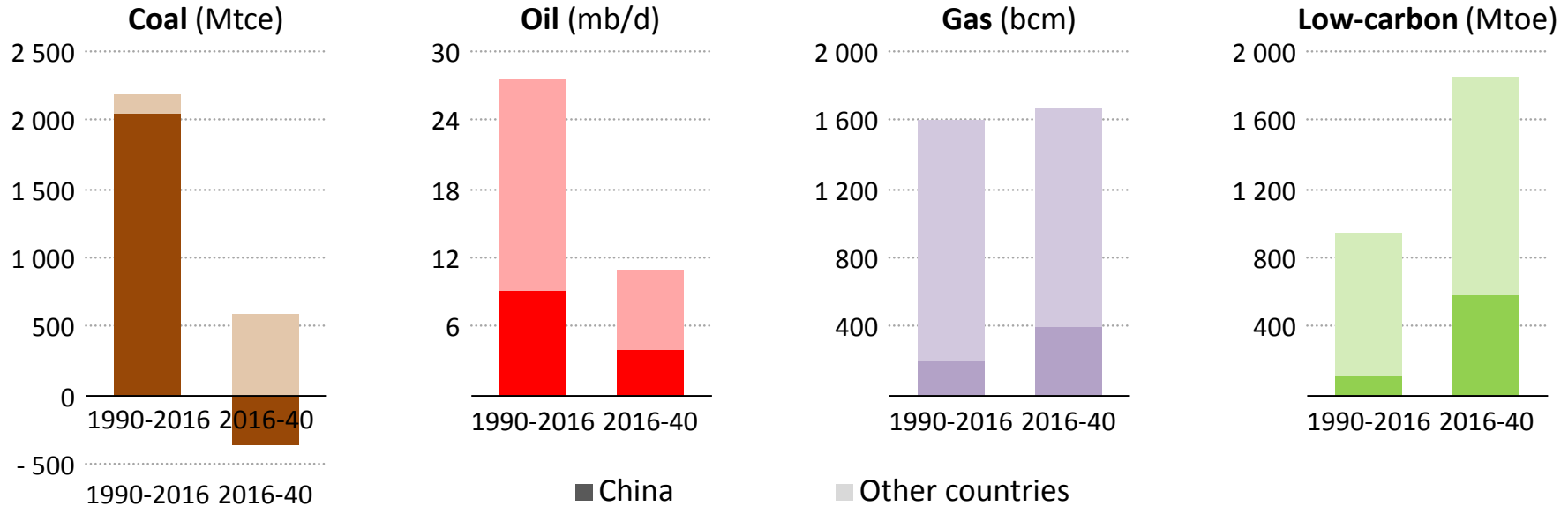
Change in energy demand, 2016-40 (Mtoe)



Old ways of understanding the world of energy are losing value as countries change roles: the Middle East is fast becoming a major energy consumer & the United States a major exporter

A world in transition: global energy markets, again

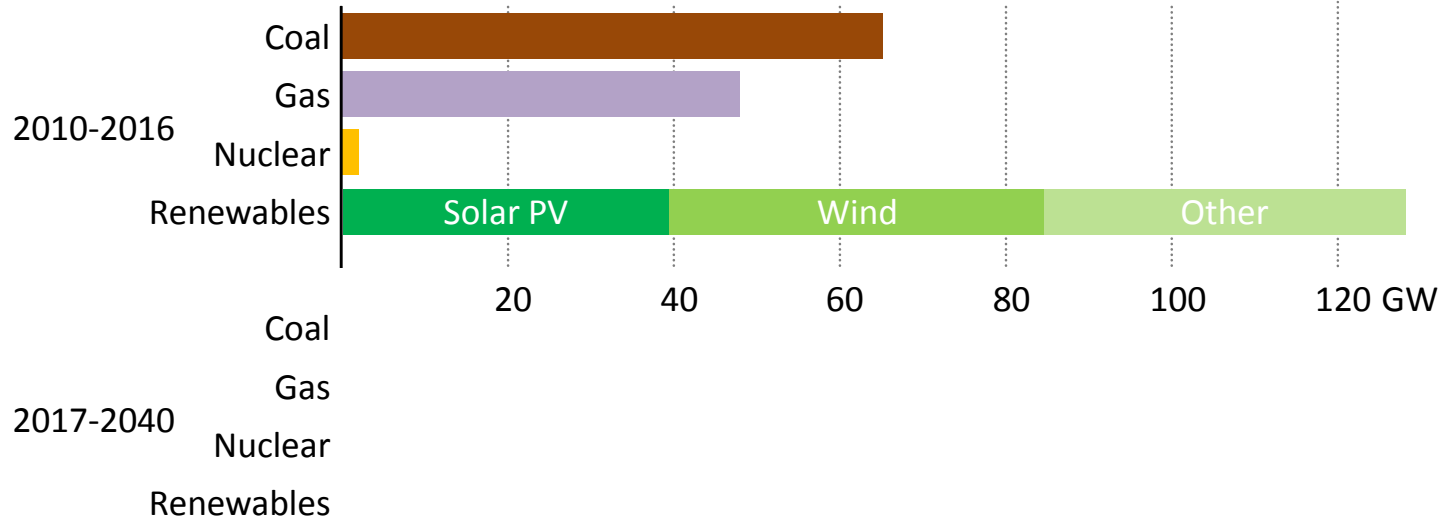
Change in world energy demand by fuel



Low-carbon sources & natural gas meet 85% of the increase in global demand: China's switch to a new economic model & a cleaner energy mix drives global trends

Solar PV forges ahead in the global power mix

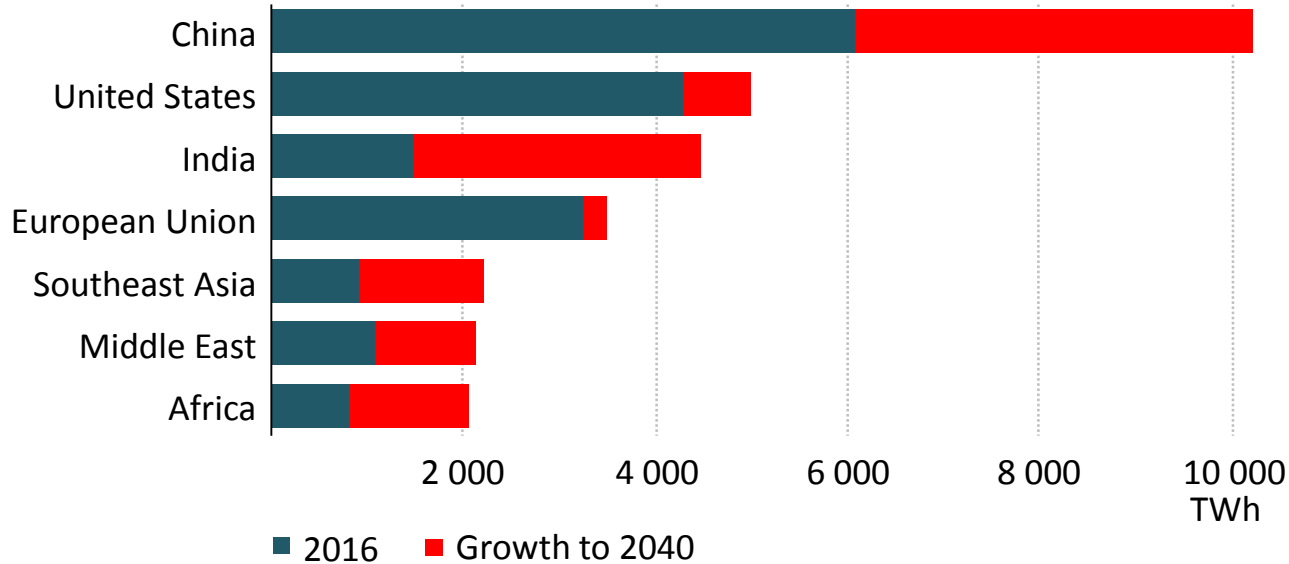
Global average annual net capacity additions by type



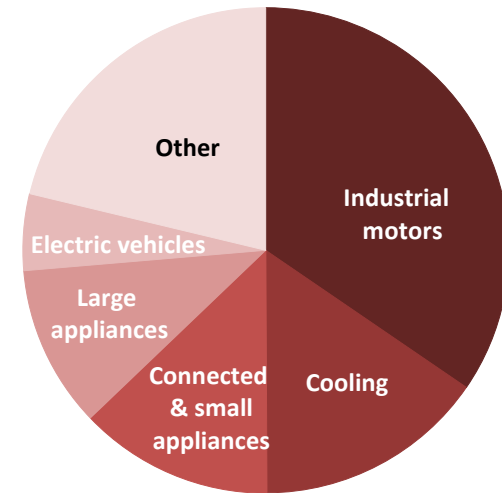
China, India & the US lead the charge for solar PV, while Europe is a frontrunner for onshore & offshore wind: rising shares of solar & wind require more flexibility to match power demand & supply

The future is electrifying

Electricity generation by selected region



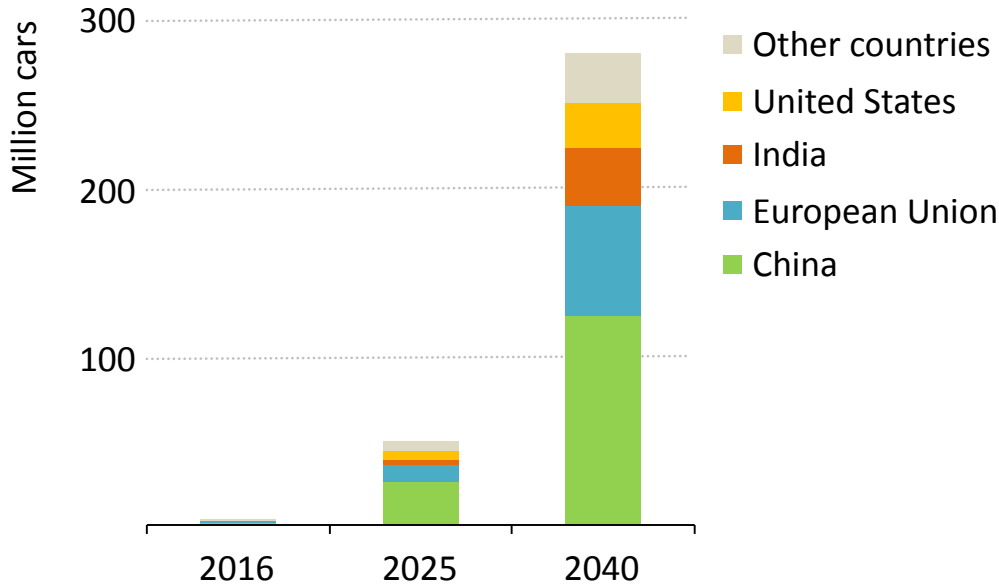
Sources of global electricity demand growth



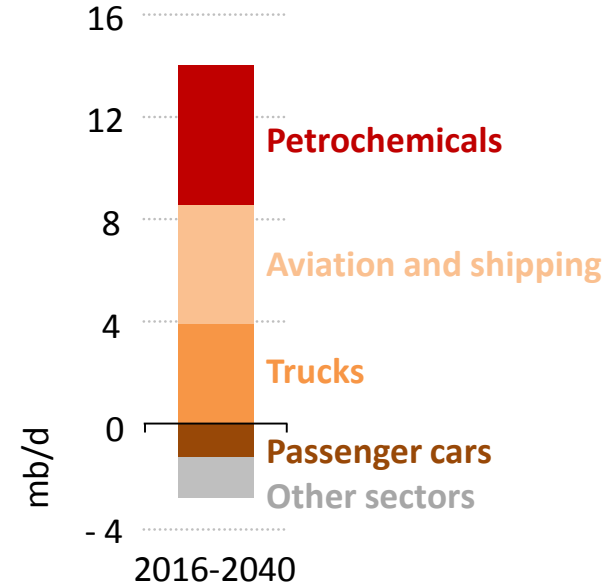
India adds the equivalent of today's European Union to its electricity generation by 2040, while China adds the equivalent of today's United States

EVs are on the way, but oil demand still keeps rising

Electric car fleet

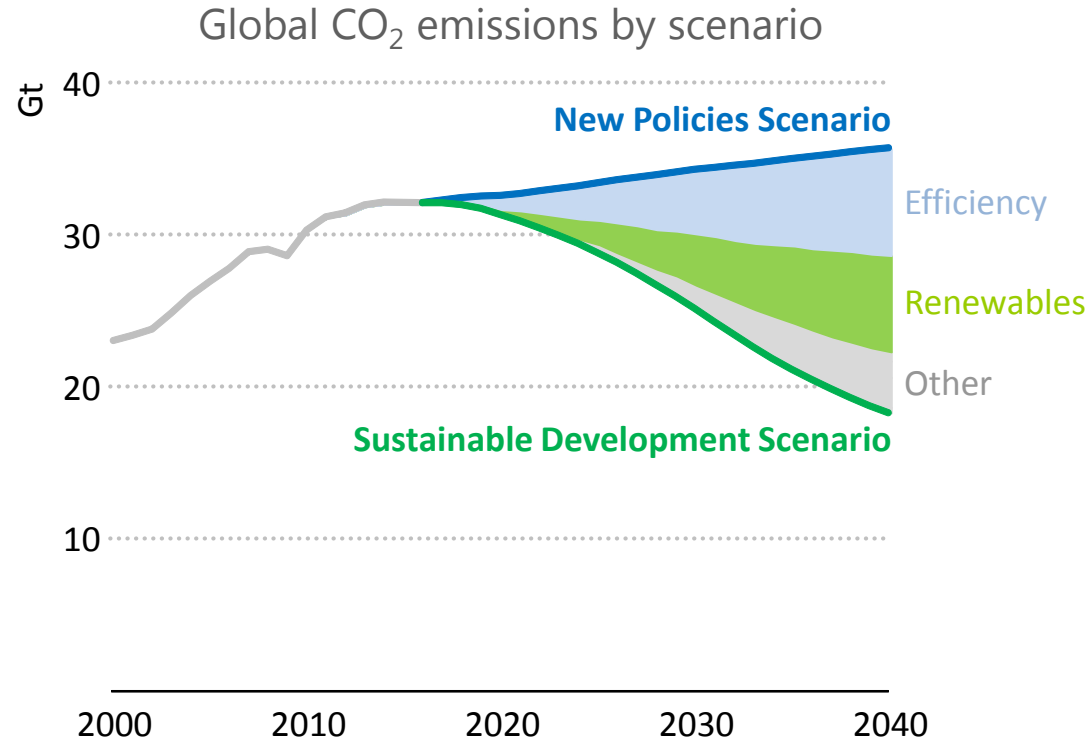


Change in global oil demand



Electric cars are helping to transform energy use for passenger cars, slowing the pace of growth in global oil demand: however, trucks, aviation, shipping & petrochemicals keep oil on a rising trend

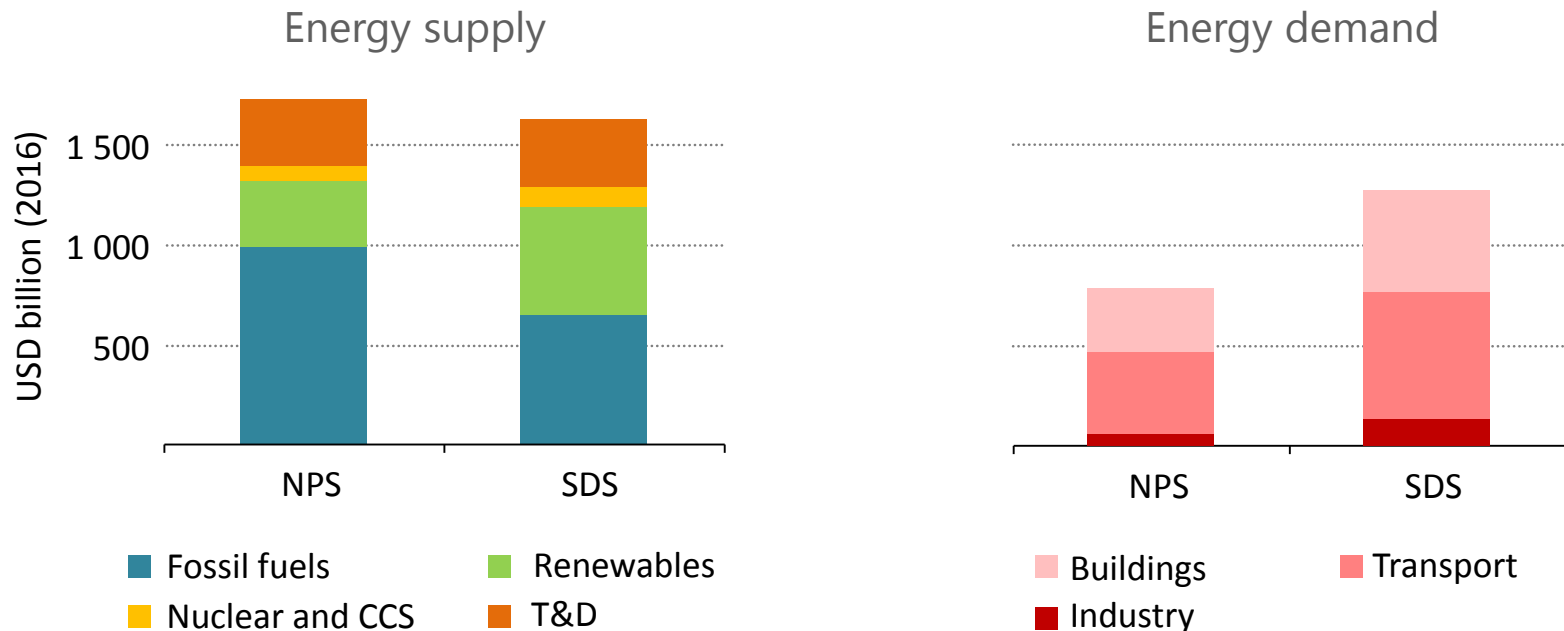
A new strategy for energy & sustainable development



The Sustainable Development Scenario reduces CO₂ emissions in line with the objectives of the Paris Agreement, while also tackling air pollution and achieving universal energy access

Sustainable investment needs

Average annual investment in the New Policies and Sustainable Development Scenarios, 2017-2040



The Sustainable Development Scenario requires 15% additional investment to 2040; two-thirds of energy supply investment are needed for electricity generation & networks

- Progress is being made towards the SDGs, but under current trends the goals on climate change, air pollution and universal access will not be met
- Our strategy for sustainable energy shows that concerted action to address climate change is fully compatible with global goals on universal access & air quality
- The Sustainable Development Scenario requires an additional 15% of investment and profound changes in energy production & use
- There are strong synergies between renewable energy and energy efficiency that can be harnessed to accelerate the clean energy transition
- Electrification & digitalisation are the future for many parts of the global energy system, creating new opportunities but also risks that policy makers have to address



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